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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Remo Meister

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EXAMINER

KOCA, HUSEYIN

ART UNIT

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3744

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/538,700	Applicant(s) MEISTER, REMO	
	Examiner HUSEYIN KOCA	Art Unit 3744	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 June 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 11-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 11-26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 June 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>10/23/06</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

1. Figures 1-6 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.
2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference characters "3" (Specification, page 2, line 35) and "11" (Specification, page 5, line 24) have both been used to designate "the injection valve". Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

3. In addition to Replacement Sheets containing the corrected drawing figure(s), applicant is required to submit a marked-up copy of each Replacement Sheet including annotations indicating the changes made to the previous version. The marked-up copy must be clearly labeled as "Annotated Sheets" and must be presented in the amendment or remarks section that explains the change(s) to the drawings. See 37 CFR 1.121(d)(1). Failure to timely submit the proposed drawing and marked-up copy will result in the abandonment of the application.

Specification

4. The disclosure is objected to because of the following informalities:
- Applicant is advised to be consistent with the names disclosed in the specification. Applicant uses the term "the expansion valve" and "the injection valve" for item indicated by reference number 3.

Appropriate correction is required.

Claim Objections

1. Claims 13-18 are objected to because of the following informalities:
- Claim 13 recites, "the suction vapor temperature at the compressor inlet" (lines 2-3) which renders the claim indefinite because the limitation was not previously taught in the claim 13 or the claim(s) which claim 13 depends on.

- Claim 14 recites, "the hot-gas temperature at the exit of the compressor, the compressor oil temperature, the suction pressure at the compressor and/or the high pressure upstream of the injection valve or downstream of the compressor" (lines 2-5) which renders the claim indefinite because the cited limitations were not previously taught in the claim 14 or the claim(s) which claim 14 depends on.
- Claim 15 recites, "optimally for the particular type of evaporator" (lines 2-3) which renders the claim indefinite because the limitation is not clear as to what or which type of evaporator claim 15 is referring to.
- Claim 15 further recites, "the lg p, h diagram" (line 3) which renders the claim indefinite because the limitation was not previously taught in the claim 15 or the claim(s) which claim 15 depends on.
- Claim 16 recites, "the refrigerant suction vapor temperature" (lines 3-4) which renders the claim indefinite because the limitation was not previously taught in the claim 16 or the claim(s) which claim 16 depends on.
- Claim 17 recites, "the measured value for limiting the suction vapor temperature" (lines 2-3) which renders the claim indefinite because the limitation was not previously taught in the claim 17 or the claim(s) which claim 17 depends on. Additionally, it is not clear from the claims what the measure value is (which measure value are they referring to), and how it is related to the suction vapor temperature.

- Claim 18 recites, “the IHE” (lines 3, 5) and “the lg p, h diagram” (line 4) which renders the claim indefinite because the limitations were not previously taught in the claim 18 or the claim(s) which claim 18 depends on.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 11, 12, 17, and 21 are rejected under 35 U.S.C. 102(e) as being anticipated by Yoshihiko (JP-2002267279).

In regard to claim 11, Yoshihiko teaches a method for controlling evaporators in refrigeration plants, wherein control is carried out after the evaporation process has begun, with the evaporation pressure at the inlet of the evaporator (7) normally being used as one control variable and the refrigerant supercooling temperature upstream of the injection valve (6) being used as second control variable, so that in this way the start of evaporation is defined and controlled (Drawing 1; Drawing 2; paragraphs 0007-0017).

In regard to claim 12, Yoshihiko teaches an internal heat exchanger (IHE) (4) is connected downstream of the evaporator (7) (Drawing 2).

In regard to claims 17 and 21, Yoshihiko teaches that the measured value for limiting suction vapor temperature upstream of the compressor (any measured temperature upstream of the compressor) over-controls the evaporation control and keeps the suction vapor temperature constant at an optimum value as a function of the compressor (Yoshihiko measures temperatures upstream of the compressor via sensors 14 and 17. The temperature sensed by sensor 14 over-controls the evaporation control. The temperature at the exit of the evaporator (suction vapor temperature) is hold constant because it is set by temperature setting means 22. This value is used as optimum value as a function of the compressor.) (paragraphs 0007-0017).

7. Claims 11, 12, 15, and 16 are rejected under 35 U.S.C. 102(e) as being anticipated by Caesar et al. (6,817,193).

In regard to claim 11, Caesar et al. teach a method for controlling evaporators in refrigeration plants, wherein control is carried out after the evaporation process has begun, with the evaporation pressure (P5) at the inlet of the evaporator (5) normally being used as one control variable and the refrigerant supercooling temperature (T3 or T4) upstream of the injection valve (4) being used as second control variable, so that in this way the start of evaporation is defined and controlled (Fig. 1; C-3, L-20-67; C-4, L-1-41; C-5, L-1-10).

In regard to claim 12, Caesar et al. teaches an internal heat exchanger (IHE) (9) is connected downstream of the evaporator (5) (Fig. 1).

In regard to claim 15, Caesar et al. teach that the control is effected optimally for the particular type of evaporator, near to the left-hand limit curve of the lg p, h diagram for refrigerant (C-3, L-55-65; C-4, L-56-63).

In regard to claim 16, Caesar et al. teach that the control causes the evaporator to be flooded and the degree of flooding to be determined, and at the same time causes the refrigerant suction vapor temperature and refrigerant liquid temperature to be monitored and controlled (Fig. 1; C-5, L-1-10).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

10. Claims 13, 14, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshihiko (JP-2002267279) as applied to claim 11 above, and further in view of Shunji et al. (EP-1014013).

In regard to claim 13, Yoshihiko teaches most of the limitation of the claim but do not explicitly teach a further measured value such as a vapor temperature at the compressor inlet to optimize the control of the evaporators and ensure protection for the compressor. Shunji et al. teach measuring the suction vapor temperature at the compressor (2) inlet (via sensor 10) to control the evaporators and ensure protection for the compressor (2). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Yoshihiko so that the evaporators can also be controlled based on the suction vapor temperature at the compressor inlet as taught by Shunji et al. in order to advantageously improve the efficiency of the evaporators and the compressor.

In regard to claim 14, Yoshihiko teaches most of the limitation of the claim but do not explicitly teach a further measured value such as a hot-gas temperature at the exit of the compressor. Shunji et al. teach measuring the hot-gas temperature at the exit of the compressor (2) (via sensor 12) to control the evaporators and ensure protection for the compressor (2). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Yoshihiko so that the evaporators can also be controlled based on the hot-gas temperature at the exit of the compressor as taught by Shunji et al. in order to advantageously improve the efficiency of the compressor and also protect the compressor since the hot-gas temperature at the exit of the compressor defines the operational characteristic of the compressor.

In regard to claim 16, Yoshihiko teaches causing evaporator to be flooded (have fluid pass through) and the degree of flooding to be determined (paragraphs 0007-0017)

but do not explicitly teach refrigerant suction vapor temperature to be monitored. Shunji et al. teaches monitoring refrigerant suction vapor temperature (via sensor 10) (Fig. 1). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Yoshihiko so that the refrigerant suction vapor temperature can be monitored and controlled as taught by Shunji et al. in order to advantageously increase the efficiency of the system and protect the compressors since the amount of refrigerant going through the expansion valve will be affecting the refrigerant suction vapor temperature.

11. Claims 18-20 and 22-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshihiko (JP-2002267279) as applied to claim 11 above.

In regard to claim 18, Yoshihiko teach most of the limitations of the claim but do not explicitly teach that the optimum process is always in favor of the evaporator. The general concept of providing maximum utilization of enthalpy in the evaporator falls within the realm of common knowledge as obvious mechanical expedient and one of ordinary skill in the art at the time of the invention was made would know that maximum utilization of the enthalpy in the evaporator will be in favor of the evaporator, and this maximum utilization will also depend on the other factors of the refrigeration system such as temperature level of the IHE, and etc.

In regard to claims 19, 20, and 22-26, Applicant admits that it is irrelevant whether the refrigeration system comprises one or a plurality of evaporators, one or a plurality of IHEs, one or plurality of compressors, or one or a plurality of injection valves, and whether or not they are combined to form groups. It is also irrelevant whether or not

Art Unit: 3744

one or more evaporators are combined into groups with only one or more IHEs. Any combination of injection valves, evaporators, IHEs, and compressors is therefore possible (Specification, page 6 lines 6-16; or US Pub No: 2006/0242974 paragraph 0027). Since Yoshihiko teaches the method of claim 11, than it would have been obvious to one having ordinary skill in the art at the time the invention was made to apply this method to a refrigeration system with any combination of injection valves, evaporators, IHEs, and compressors.

Remarks

12. Examiner has cited particular paragraphs, figures, columns and line numbers in the references as applied to the claims above for the convenience of the applicant. Although the specified citations are representative of the teachings in the art and are applied to the specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested from the applicant, in preparing the responses, to fully consider the references in entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the examiner.

Conclusion

Art Unit: 3744

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to HUSEYIN KOCA whose telephone number is (571)272-3048. The examiner can normally be reached on Monday - Friday 9:00AM to 4:00PM.

14. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cheryl Tyler or Frantz Jules can be reached on (571) 272-4834 or (571) 272-6681. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

15. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/HK/

/Frantz F. Jules/
Supervisory Patent Examiner, Art Unit 3744